CARNEGIE INSTITUTION OF WASHINGTON
DEPARTMENT OF GENETICS
COLD SPRING HARBOR, LONG ISLAND, N. Y.

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Dear Lu,

I forgot that you had heard nothing about the dead phages among progeny of Kozloff parents. I can't find any by killing titer either. They are detected as follows.

Infect bacteria with 5 each UV P32 and live P31 phage T2. This causes a 50% loss of infective centers at high UV doses, but otherwise the transfer of P32 to progeny is more or less normal, as Kozloff believed.

The early lysis progeny are tested for dead phages, as you suspected, by comparing efficiency of 2nd cycle transfer in single infection as compared to mixed infection with live cold phage. There is practically no difference except that caused by UV. Almost the maximum effect is produced by 10 hits, very little effect by 2 hits; I do not yet have many data for small doses. The largest dose tested is 80 hits.

The maximum effect is as follows. Dead phages, that is, phages capable of passing on P32 in mixed but not in single infection, contain 50% of the total transferred phosphorus from the UV parent and ca 15% of the total transferred phosphorus from the live parent.

I tried to do these experiments several years ago, but failed to solve the technical problems.

My main conclusion, a la Doermann, is that this establishes a correlation between material and genetic transfer. On the strength of it, we are repeating the old experiments with h marker substituted for UV.

The limit at 50% I tentatively ascribe to 50-15 = 35% of transferred DNA that is genetic material, the other being UV resistant.

The 15% coming from live parents is mostly non-genetic DNA, i.e. randomly dispersed relative to UV damages. If so, there are only about 15% dead phages among the progeny.

The main task is to measure the number of dead offspring per UV parent, in an attempt to enumerate the genetic pieces. We think this may be possible if the UV parent is also genetically marked and if, as we suspect, the dead ones will contain markers from the UV parent. This is an extension of an idea from Frank Stahl.

Already the fact that there are very few dead particles suggests that the number of UV-sensitive pieces per phage is small, a point about which I am quarreling with Stent, who prefers to think that all the DNA is UV sensitive.

Shall I see you at the meeting in New York that is to spell the doom of poliomyelites on February 21? From program just received I see I shall.

Sincerely,

Al.